

**19. DATA SHEETS****DATA SHEET 1  
VEHICLE INFORMATION**

MAKE/MODEL/BODY STYLE: \_\_\_\_\_

MODEL YEAR: \_\_\_\_\_ ; MANUFACTURE DATE: \_\_\_\_\_

NHTSA NO.: \_\_\_\_\_ ; VIN: \_\_\_\_\_

GVWR: \_\_\_\_\_ ; WHEELBASE: \_\_\_\_\_

GAWR FRONT: \_\_\_\_\_ ; GAWR REAR: \_\_\_\_\_

FOR BUSES ONLY –

CHASSIS MFR: \_\_\_\_\_

SERIAL NO.: \_\_\_\_\_ ; NO. OF SEATS: \_\_\_\_\_

MANUFACTURE DATE: \_\_\_\_\_

ENGINE TYPE: \_\_\_\_\_ ; DISPLACEMENT: \_\_\_\_\_

ENGINE HORSEPOWER: \_\_\_\_\_ ; IDLE SPEED: \_\_\_\_\_

TRANSMISSION TYPE: \_\_\_\_\_ ; NO. OF AXLES: \_\_\_\_\_

TIRE SIZE: \_\_\_\_\_ ; TYPE: \_\_\_\_\_

TIRE MANUFACTURER: \_\_\_\_\_

RECOMMENDED PRESSURE AT GVWR: FRONT - \_\_\_\_\_ psi; REAR - \_\_\_\_\_ psi

BRAKES - FRONT: DRUM \_\_\_\_\_ DISC \_\_\_\_\_

BRAKES - REAR: DRUM \_\_\_\_\_ DISC \_\_\_\_\_

BRAKE ACTUATION - Describe Hydraulic Circuit Split: \_\_\_\_\_

BRAKE POWER UNIT: \_\_\_ Hydraulic ; \_\_\_ Vacuum ; \_\_\_ Other

(Continued on next page)

**19. DATA SHEETS....Continued**

	<b>YES</b>	<b>NO</b>
BRAKE POWER ASSIST UNIT:	—	—
BRAKE POWER UNIT WITH ACCUMULATOR:	—	—
BRAKE POWER ASSIST OR POWER UNIT WITH BACKUP:	—	—
VARIABLE PROPORTIONING SYSTEM:	—	—
ANTI-SKID DEVICE:	—	—
MFR - _____		

PARKING MECHANISM: \_\_\_\_\_

DESCRIBE - \_\_\_\_\_

BRAKE MASTER CYLINDER DIAMETER: \_\_\_\_\_

BRAKE PEDAL RATIO: \_\_\_\_\_

**FRONT BRAKE COMPONENT MATERIALS AND CONSTRUCTION:**

<b>DRUM ( ) or DISC ( )</b>					
	<b>MATERIAL</b>		<b>CONSTRUCTION (drum)</b>		<b>CONSTRUCTION (disc)</b>
	Cast Iron		Cast		Integral Cast
	Steel		Composite		2-Piece
	Bi-Metallic		Centrifuge		Vented
			Pressed		Unvented
					Bonded Pads

FRONT BRAKE DIAMETER: Inside - \_\_\_\_\_ ; Outside - \_\_\_\_\_

FRONT **DISC** BRAKE THICKNESS (include vent) : \_\_\_\_\_

FRONT **DRUM** BRAKE SHOE CAGE DIAMETER: Left - \_\_\_\_\_ ; Right - \_\_\_\_\_

DIAMETER RESET TO: Left - \_\_\_\_\_ ; Right - \_\_\_\_\_

(Continued on next page)

**19. DATA SHEETS....Continued****FRONT BRAKE COMPONENT DIMENSIONS AND LINING CODE/COLOR:**

	FOR <b>DRUM</b> BRAKES		FOR <b>DISC</b> BRAKES	
WIDTH	Primary		Inboard	
	Secondary		Outboard	
LENGTH	Primary		Inboard	
	Secondary		Outboard	
THICKNESS	Primary		Inboard	
	Secondary		Outboard	
CODE/COLOR	Primary *		Inboard	
	Secondary *		Outboard	

\* Primary/Secondary may be leading/trailing or other \_\_\_\_\_

**HYDRAULIC PISTON DIAMETER:**

**DRUM BRAKE WHEEL CYLINDER** - \_\_\_\_\_

**DISC BRAKE CALIPER** - \_\_\_\_\_

**REAR BRAKE COMPONENT MATERIALS AND CONSTRUCTION:**

<b>DRUM ( ) or DISC ( )</b>					
	<b>MATERIAL</b>		<b>CONSTRUCTION (drum)</b>		<b>CONSTRUCTION (disc)</b>
	Cast Iron		Cast		Integral Cast
	Steel		Composite		2-Piece
	Bi-Metallic		Centrifuge		Vented
			Pressed		Unvented
					Bonded Pads

REAR BRAKE DIAMETER: Inside - \_\_\_\_\_ ; Outside - \_\_\_\_\_

REAR **DISC** BRAKE THICKNESS (include vent): \_\_\_\_\_

(Continued on next page)

**19. DATA SHEETS....Continued**

REAR **DRUM** BRAKE SHOE CAGE DIAMETER: Left - \_\_\_\_\_ ; Right - \_\_\_\_\_

DIAMETER RESET TO: Left - \_\_\_\_\_ ; Right - \_\_\_\_\_

**REAR** BRAKE COMPONENT DIMENSIONS AND LINING CODE/COLOR:

	FOR <b>DRUM</b> BRAKES		FOR <b>DISC</b> BRAKES	
WIDTH	Primary		Inboard	
	Secondary		Outboard	
LENGTH	Primary		Inboard	
	Secondary		Outboard	
THICKNESS	Primary		Inboard	
	Secondary		Outboard	
CODE/COLOR	Primary *		Inboard	
	Secondary *		Outboard	

\* Primary/Secondary may be leading/trailing or other \_\_\_\_\_

HYDRAULIC PISTON DIAMETER:

**DRUM** BRAKE WHEEL CYLINDER - \_\_\_\_\_

**DISC** BRAKE CALIPER - \_\_\_\_\_

OTHER COMPONENT INFORMATION:

Friction-type Parking Brake - \_\_\_\_\_ Hand Operated

\_\_\_\_\_ Foot Operated

Nonservice Brake Type Parking Brake - \_\_\_\_\_ Hand Operated

\_\_\_\_\_ Foot Operated

**NOTE:** If at any time after the test series has begun, any brake system part requires replacement or the brake system requires adjustments other than permitted in burnish and reburnish procedures, discontinue testing and notify the COTR immediately.

Technician: \_\_\_\_\_

Date: \_\_\_\_\_

Quality Assurance: \_\_\_\_\_

## 19. DATA SHEETS...Continued

**DATA SHEET 2**  
**SUMMARY OF TESTING (Sample - incomplete)**

VEHICLE: \_\_\_\_\_ NHTSA NO.: \_\_\_\_\_  
DATE \_\_\_\_\_

		Specification and Limit				TEST RESULTS (In compliance if one stop meets requirement)			
TEST	Loading Condition	Speed (km/h)	Min. Pedal Force (N)	Max. Pedal Force (N)	Stopping Distance Requirement (m)	Shortest Stop Min. Pedal Force (N)	Shortest Stop Max. Pedal Force (N)	Shortest Stop Stopping Distance (m)	PASS Fail
Equipment Requirements					Specified Equipment				
Vehicle Maximum Speed	LLVW					-			
Burnish	GVWR					-			
Wheel Lockup Sequence w/o ABS	GVWR				Lockup of front wheels prior to rear				
Wheel Lockup Sequence w/o ABS	LLVW								
Adhesion Utilization w/o ABS	LLVW				Rear axle adhesion utilization curve below specified value				
Adhesion Utilization w/o ABS	GVWR								
Cold Effectiveness	GVWR	100	65	500	70 m				
High Speed Effectiveness	GVWR		65	500	speed dependant				
Stops with Engine Off	GVWR	100	65	500	70 m				
Cold Effectiveness	LLVW	100	65	500	70				
High Speed Effectiveness	LLVW		65	500	speed dependant				
Failed Antilock	LLVW	100	65	500	85				
Failed Proportioning Valve	LLVW	100	65	500	110				
Failed Hydraulic Circuit #1	LLVW	100	65	500	168				
Failed Hydraulic Circuit #2	LLVW	100	65	500	168				
Failed Hydraulic Circuit #1	GVWR	100	65	500	168				
Failed Hydraulic Circuit #2	GVWR	100	65	500	168				
Failed Antilock	GVWR	100	65	500	85				
Failed Proportioning Valve	GVWR	100	65	500	110				
Power Brake Unit Failure	GVWR	100	65	500	168				
Parking Brake - Uphill	GVWR	-	-	-	-				
Parking Brake - Downhill	GVWR	-	-	-	-				
Heating Snubs	GVWR								
Hot Performance Stop #1	GVWR	100	65						
Hot Performance Stop #2	GVWR	100	65	500	89				
Recovery Performance Stop	GVWR	100	65						
Final Inspection-Brake Integrity									
Final Inspection- Reservoirs/Warning Indicators									

**19. DATA SHEETS....Continued****DATA SHEET 3  
VEHICLE WEIGHT**

VEHICLE: \_\_\_\_\_ ; NHTSA NO.: \_\_\_\_\_ ; DATE: \_\_\_\_\_

TIRE PRESSURE (Cold): Front - \_\_\_\_\_ Rear - \_\_\_\_\_

ODOMETER READING: Start - \_\_\_\_\_ Finish - \_\_\_\_\_

SCALE(S) USED: \_\_\_\_\_

NOTE: GVWR, LLVW and axle weights to measured within + 0% and -1%.

GVWR/GAWR INFORMATION (taken from vehicle Certification Label):

GVWR - \_\_\_\_\_ lb (GAWR Front = \_\_\_\_\_ lb and GAWR Rear = \_\_\_\_\_ lb)

UNLOADED VEHICLE WEIGHT (UVW):

Left Front - \_\_\_\_\_ lb

Left Rear - \_\_\_\_\_ lb

Right Front - \_\_\_\_\_ lb

Right Rear - \_\_\_\_\_ lb

Total Front - \_\_\_\_\_ lb

Total Rear - \_\_\_\_\_ lb

TOTAL UVW - \_\_\_\_\_ lb

Front Axle Load % = Total Front / TOTAL UVW = \_\_\_\_\_ %

Rear Axle Load % = Total Rear / TOTAL UVW = \_\_\_\_\_ %

LIGHT LOADED VEHICLE WEIGHT (LLVW):

Note 1: LLVW = UVW + 400 lb

Note 2: Weight distributed in front passenger seat area

Note 3: Neither axle load at LLVW less than at UVW; ballast as required

Left Front - \_\_\_\_\_ lb

Left Rear - \_\_\_\_\_ lb

Right Front - \_\_\_\_\_ lb

Right Rear - \_\_\_\_\_ lb

(Continued on next page)

**19. DATA SHEETS....Continued**

Total Front - \_\_\_\_\_ lb

Total Rear - \_\_\_\_\_ lb

TOTAL LLVW - \_\_\_\_\_ lb

Front Axle Load % = Total Front / TOTAL LLVW = \_\_\_\_\_ %

Rear Axle Load % = Total Rear / TOTAL LLVW = \_\_\_\_\_ %

**ACTUAL TEST LLVW:**

Left Front - \_\_\_\_\_ lb

Left Rear - \_\_\_\_\_ lb

Right Front - \_\_\_\_\_ lb

Right Rear - \_\_\_\_\_ lb

Total Front - \_\_\_\_\_ lb

Total Rear - \_\_\_\_\_ lb

TOTAL ACTUAL TEST LLVW - \_\_\_\_\_ lb

Front Axle Load % = Total Front / TOTAL ACTUAL TEST LLVW = \_\_\_\_\_ %

Rear Axle Load % = Total Rear / TOTAL ACTUAL TEST LLVW = \_\_\_\_\_ %

Load: Driver/Observer-\_\_\_\_# + Instru.-\_\_\_\_# + Ballast-\_\_\_\_# = 400 lbs

**FULLY LOADED VEHICLE WEIGHT (GVWR):**

Note 1: Vehicle loaded so axle loads proportional to GAWR shown previously

Note 2: But no axle weight to be less than at LLVW

Note 3: If weight on any axle at LLVW exceeds the axle's proportional share of the GVWR, the load required to reach GVWR is placed so that the weight on that axle remains the same as at LLVW. Neither axle load at LLVW **LESS THAN** at UDW.

Load: Driver/Observer-\_\_\_\_# + Instru.-\_\_\_\_# + Ballast-\_\_\_\_# = \_\_\_\_\_ lbs

Left Front - \_\_\_\_\_ lb

Left Rear - \_\_\_\_\_ lb

Right Front - \_\_\_\_\_ lb

Right Rear - \_\_\_\_\_ lb

Total Front - \_\_\_\_\_ lb

Total Rear - \_\_\_\_\_ lb

(Continued on next page)

**19. DATA SHEETS....Continued**

FULLY LOADED VEHICLE WEIGHT (GVWR) - \_\_\_\_\_ lb

Front Axle Load % = Total Front / FULLY LOADED VEH. WT. (GVWR) = \_\_\_\_\_ %

Rear Axle Load % = Total Rear / FULLY LOADED VEH. WT. (GVWR) = \_\_\_\_\_ %

Comments:

TECHNICIAN: \_\_\_\_\_ ; QUALITY ASSURANCE: \_\_\_\_\_

APPROVING LAB. OFFICIAL: \_\_\_\_\_ DATE: \_\_\_\_\_



## 19. DATA SHEETS....Continued

### DATA SHEET 4 EQUIPMENT REQUIREMENTS (S5)

Service Brake System (S5.1): \_\_\_\_\_

Vehicle equipped with a service brake system acting on all wheels? YES\_\_\_ NO\_\_\_

Wear Adjustment (S5.1.1):

Service Brakes are compensated for wear by means of a system of automatic adjustment?

YES\_\_\_ NO\_\_\_

Describe: \_\_\_\_\_

Wear Status (S5.1.2):

Wear status of service brakes is indicated by:

(A) Acoustic or optical device? YES\_\_\_ NO\_\_\_

Describe: \_\_\_\_\_

(B) Visual check outside or under vehicle? YES\_\_\_ NO\_\_\_

Describe: \_\_\_\_\_

Parking Brake System (S5.2):

Vehicle equipped with a parking brake system of a friction type with solely mechanical means to retain engagement:

YES\_\_\_ NO\_\_\_

Controls (S5.3):

(A) Service brakes activated by means of a foot control? YES\_\_\_ NO\_\_\_

(B) Parking brake control is independent of the service brake control? YES\_\_\_ NO\_\_\_

(C) Parking brake control is hand or foot operated? YES\_\_\_ NO\_\_\_

(D) ABS, if equipped, cannot be manually disabled? YES\_\_\_ NO\_\_\_

**19. DATA SHEETS....Continued**

DATA INDICATES COMPLIANCE:

YES \_\_\_\_\_

NO \_\_\_\_\_

Comments:

Tested By: \_\_\_\_\_

DATE: \_\_\_\_\_

## 19. DATA SHEETS....Continued

**DATA SHEET 5**  
**MAXIMUM SPEED**

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight:            Total = \_\_\_\_\_ kg;    Front = \_\_\_\_\_ kg;    Rear = \_\_\_\_\_ kg

Establish vehicle maximum speed

VEHICLE LOAD:    LLVW

GEAR:                Drive

PEDAL FORCE:      Not applicable

TEST SPEED: Maximum attainable from a standing start in 3.2 km.

IBT:                  Not applicable

DECEL RATE:        Not applicable

WHEEL LOCKUP:    Not applicable

INTERVAL:           Not applicable

Ballast vehicle to LLVW

Accelerate at a maximum rate from a standing start for a distance of 3.2 km on a level surface.

Repeat in opposite direction.

Record speed attained in each direction and use the average of the two runs.

	DIRECTION	MAX. SPEED (km/h)		Time 0-100 km/h
		Visual	Recorded	
Run No. 1				
Run No. 2				

Average = \_\_\_\_\_ km/h

Tested by: \_\_\_\_\_

Date: \_\_\_\_\_

## 19. DATA SHEETS....Continued

**DATA SHEET 6**  
**15.1 BURNISH (S7.1)**

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

TEST WEIGHT: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg ; Rear = \_\_\_\_\_ kg

VEHICLE LOAD: GVWR

GEAR: Drive

PEDAL FORCE: Adjust as necessary to maintain constant decel rate.

TEST SPEED: 80 km/h to 0

IBT: <100°C (Record temperatures 0.32 km before stop)

DECEL RATE: 3.0 m/s<sup>2</sup>

WHEEL LOCKUP: None longer than 0.1 seconds at speeds > 15 km/h.

INTERVAL: The interval from the start of one service brake application to the start of the next is either the time necessary to reduce the IBT to 100°C or less, or the distance of 2 km, whichever occurs first.

Comments:

(Continued on next page)

**19. DATA SHEETS....Continued****BURNISH****VISUAL DATA****NOTE:** Record what is feasible and/or modify as needed.

STOP NO.	SPEED (KM/H)	INITIAL BRAKE TEMPERATURE °C (Secondary Shoe or Hottest Pad)				MAXIMUM PEDAL FORCE (N)	MAXIMUM DECELERATION ( m/s <sup>2</sup> )	COMMENTS
		LF	RF	LR	RR			
1								
10								
20								
30								
40								
50								
60								
70								
80								
90								
100								
110								
120								
130								
140								
150								
160								
170								
180								
190								
200								

Comments:

Driver: \_\_\_\_\_

Date: \_\_\_\_\_

# 19. DATA SHEETS....Continued

## BURNISH

### RECORDED DATA

STOP NO.	SPEED (KM/H)	INITIAL BRAKE TEMPERATURE (C) (Secondary Shoe or Hottest Pad)				AVERAGE SUSTAINED PEDAL FORCE (N)	AVERAGE SUSTAINED DECELERATION ( m/s <sup>2</sup> )	COMMENTS
		LF	RF	LR	RR			
1								
10								
20								
30								
40								
50								
60								
70								
80								
90								
100								
110								
120								
130								
140								
150								
160								
170								
180								
190								
200								

Comments:

Driver: \_\_\_\_\_ Date: \_\_\_\_\_

**19. DATA SHEETS....Continued**

Brake Adjustment (Post Burnish)

Adjust to manufacturer's published recommended practice

Record method used:

Adjusted by: \_\_\_\_\_

Date \_\_\_\_\_

## 19. DATA SHEETS....Continued

### DATA SHEET 7 15.2 WHEEL LOCK SEQUENCE @ GVWR (S7.2)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER. FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

S7.2 Wheel Lockup Sequence:  
**NOTE:** Wheel lockup sequence is **NOT** an S135 compliance requirement for ABS equipped vehicles.

**NOTE:** Vehicles that lock their front axle simultaneously or at lower deceleration rates than their rear axle need not be tested to the torque wheel procedure.

#### S7.2.2 Vehicle Conditions:

- A. Vehicle load: GVWR
- B. Transmission Position: Neutral

#### S7.2.3 Test Conditions and Procedures

IBT: .50°C, 100°C

##### TEST SPEEDS:

65 km/h for braking ratio .50, 100 km/h for braking ratio .50

##### PEDAL FORCE:

Is increased at a linear rate such that the first axle lockup occurs no less than 0.5 second and no more than 1.5 seconds after the initial application of the pedal.

The pedal is released when the second axle locks, or when the pedal force reaches 1 kN (225 lbs), or 0.1 seconds after first axle lockup, whichever occurs first.

##### WHEEL LOCKUP:

Only wheel lockups above a vehicle speed of 15 km/h are considered in determining the results of this test.



**19. DATA SHEETS....Continued****TEST SURFACES:**

Each loading condition on two different test surfaces, resulting in a braking ratio of between 0.15 and 0.80.

**TEST PROCEDURE:**

Each test surface, three runs meeting pedal and time for wheel lockup requirements. Six (6) runs allowed to obtain 3 valid runs.

**S7.2.4 PERFORMANCE REQUIREMENTS:**

Meets test requirements on all test surfaces.

All 3 valid runs on each test surface result in front axle locking before or simultaneously with rear axle.

Comments:

# 19. DATA SHEETS....Continued

## WHEEL LOCK SEQUENCE @ GVWR

### VISUAL DATA

Stop No.	IBT Front	IBT Rear	Initial Vehicle Speed	Pedal Force Rate (N/Sec)	Vehicle Deceleration, Pedal Force, Time of each Wheel at Lockup				RESULT Front/Rear Lockup
					LF	RF	LR	RR	
Test Surface _____									
1					25m/s <sup>2</sup> /78N/.3sec				
2									
3									
4									
5									
6									
Test Surface _____									
1									
2									
3									
4									
5									
6									

Comments:

## 19. DATA SHEETS....Continued

**WHEEL LOCK SEQUENCE @ GVWR**

## RECORDED DATA

Stop No.	IBT Front	IBT Rear	Initial Vehicle Speed	Pedal Force Rate (N/Sec)	Vehicle Deceleration, Pedal Force, Time of each Wheel at Lockup				RESULT Front/Rear Lockup
					LF	RF	LR	RR	
Test Surface _____									
1									
2									
3									
4									
5									
6									
Test Surface _____									
1									
2									
3									
4									
5									
6									

Data indicates compliance: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

Driver: \_\_\_\_\_

Observer: \_\_\_\_\_

Date: \_\_\_\_\_

# 19. DATA SHEETS....Continued

## DATA SHEET 8 15.3 WHEEL LOCK SEQUENCE @ LLVW(S7.2)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

REPEAT 15.2 WITH VEHICLE LOAD AT LLVW

### VISUAL DATA

Stop No.	IBT Front	IBT Rear	Initial Vehicle Speed	Pedal Force Rate (N/Sec)	Vehicle Deceleration, Pedal Force, Time of each Wheel at Lockup				RESULT Front/ Rear Lockup	
					LF	RF	LR	RR		
Test Surface _____										
1					25m/s <sup>2</sup> /78N/.3sec					
2										
3										
4										
5										
6										
Test Surface _____										
1										
2										
3										
4										
5										
6										

Comments:

## 19. DATA SHEETS....Continued

**WHEEL LOCKUP SEQUENCE @ LLVW**

## RECORDED DATA

Stop No.	IBT Front	IBT Rear	Initial Vehicle Speed	Pedal Force Rate (N/Sec)	Vehicle Deceleration, Pedal Force, Time of each Wheel at Lockup				RESULT Front/Rear Lockup
					LF	RF	LR	RR	
Test Surface _____									
1									
2									
3									
4									
5									
6									
Test Surface _____									
1									
2									
3									
4									
5									
6									

Data indicates compliance: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

Driver: \_\_\_\_\_

Observer: \_\_\_\_\_

Date: \_\_\_\_\_

## 19. DATA SHEETS....Continued

**DATA SHEET 9**  
**15.5 ADHESION UTILIZATION (TORQUE WHEEL) @ LLVW (S7.4)**

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight:            Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

S7.4            Adhesion Utilization (Torque Wheel Method)

**NOTE:** Adhesion Utilization results are not an FMVSS 135 compliance requirement for ABS equipped vehicles.

S7.4.2 Vehicle Conditions:

- A.     Vehicle Load: LLVW
- B.     Transmission Position: In neutral
- C.     Tires:  
For this test, a separate set of tires, identical to those used for all other sections of this test, may be mounted on torque wheels and used to complete this portion of test.

S7.4.3 Test Conditions and Procedures:

IBT: > 65°C, < 100°C

TEST SPEEDS: 100 km/h and 50 km/h

PEDAL FORCE:

100 km/h test speed —

Ramp apply between 100 and 150 N/sec apply rate until the first axle locks or a max. of 1000 N pedal force is reached, whichever occurs first.

50 km/h test speed —

Ramp apply between 100 and 200 N/sec apply rate until the first axle locks or a max. of 1000 N pedal force is reached, whichever occurs first.

**19. DATA SHEETS....Continued****COOLING:**

Between brake applications, drive at speeds up to 100 km/h until IBT is reached.

**NUMBER OF RUNS:**

5 Stops from 50 km/h and 5 stops from 100 km/h, alternating between speeds after each stop.

**TEST SURFACE:** PFC of at least 0.9

**DATA TO BE RECORDED:**

VEHICLE SPEED PEDAL FORCE

WHEEL VELOCITY DECELERATION

BRAKE TORQUE

AT EACH WHEEL, AND HYDRAULIC LINE PRESSURE IN EACH BRAKE CIRCUIT (AT LEAST ONE FRONT WHEEL AND ONE REAR WHEEL DOWNSTREAM OF THE PROPORTIONING VALVE).

**SAMPLE RATE:**

10 HZ ON TEMP CHANNELS — 100 HZ ON ALL OTHER CHANNELS

**VISUAL DATA**

STOP NO.	Speed (km/h)		Maximum Pedal Force (N)	Wheel Velocity at Lockup (km/h)				Maximum Decel (m/s <sup>2</sup> )	Comments
	Target	Actual		LF	RF	LR	RR		
1	100								
2	50								
3	100								
4	50								
5	100								
6	50								
7	100								
8	50								
9	100								
10	50								

Comments:

## 19. DATA SHEETS....Continued

### RECORDED DATA

STOP NO.	Speed (km/h)		Maximum Pedal Force (N)	Wheel Velocity at Lockup (km/h)				Max. Decel (m/s <sup>2</sup> )	Rate of Apply (N/s)	Comments
	Target	Actual		LF	RF	LR	RR			
1	100									
2	50									
3	100									
4	50									
5	100									
6	50									
7	100									
8	50									
9	100									
10	50									

COMPLIANCE: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

DRIVER: \_\_\_\_\_

OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_



# 19. DATA SHEETS....Continued

## DATA SHEET 10 15.6 ADHESION UTILIZATION (TORQUE WHEEL) @ GVWR (S7.4)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

REPEAT 15.5 WITH VEHICLE LOAD AT GVWR

### VISUAL DATA

STOP NO.	Speed (km/h)		Maximum Pedal Force (N)	Wheel Velocity at Lockup (km/h)				Max. Decel (m/s <sup>2</sup> )	Comments
	Target	Actual		LF	RF	LR	RR		
1	100								
2	50								
3	100								
4	50								
5	100								
6	50								
7	100								
8	50								
9	100								
10	50								

Comments:

## 19. DATA SHEETS....Continued

### RECORDED DATA

STOP NO.	Speed (km/h)		Maximum Pedal Force (N)	Wheel Velocity at Lockup (km/h)				Max. Decel (m/s <sup>2</sup> )	Rate of Apply (N/s)	Comments
	Target	Actual		LF	RF	LR	RR			
1	100									
2	50									
3	100									
4	50									
5	100									
6	50									
7	100									
8	50									
9	100									
10	50									

COMPLIANCE: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

DRIVER: \_\_\_\_\_

OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_

## 19. DATA SHEETS....Continued

### DATA SHEET 11 15.7 COLD EFFECTIVENESS @ GVWR (S7.5)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

#### S.7.5.1 Vehicle conditions:

- A. Vehicle Load: GVWR
- B. Transmission Position: Neutral

#### S.7.5.2 Test Conditions and Procedures

**NOTE:** STOP IN SHORTEST DISTANCE ACHIEVABLE (BEST EFFORT) ON ALL STOPS.

IBT: >65°C, <100°C

TEST SPEED: 100 km/h

PEDAL FORCE: 65 N minimum to 500 N maximum

WHEEL LOCKUP: No lockup of any wheel for longer than 0.1 seconds at speeds greater than 15 km/h

NUMBER OF RUNS: 6 stops

TEST SURFACE: PFC of 0.9

WIND SPEED: Not greater than 5 m/s

## 19. DATA SHEETS....Continued

### S.7.5.3 Performance Requirements

Sc for hot performance stop = \_\_\_\_\_

Avg. PF for hot perf. stop = \_\_\_\_\_

STOPPING DISTANCE: <70 m from 100 km/h speed

### VISUAL DATA

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Stopping Direction	Pedal Force (N)	Vehicle Decel. (m/s <sup>2</sup> )	Wheel Lockup	Stay in Lane
		Front	Rear			Max.	Max.		
1									
2									
3									
4									
5									
6									

\*  $S < 0.10V + 0.0060V^2$  (Stopping Distance formula for vehicles with top speed of <100 km/h)

Comments:

## 19. DATA SHEETS....Continued

### RECORDED DATA

Stop No.	Test Speed (km/h)	Initial Brake Temp. (C)		Stopping Distance (m)	Pedal Force (N)			Vehicle Decel. (m/s <sup>2</sup> )		Wheel Lockup
		Front	Rear		Min.	Max.	Avg.	Max.	Avg.	
1										
2										
3										
4										
5										
6										

\*  $S < 0.10V + 0.0060V^2$  (Stopping Distance formula for vehicles with top speed of <100 km/h)

COMPLIANCE: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

DRIVER: \_\_\_\_\_

OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_

## 19. DATA SHEETS....Continued

### DATA SHEET 12 15.8 HIGH SPEED EFFECTIVENESS @ GVWR (S7.6) (Not required if vehicle maximum speed is <125 km/h)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

#### S.7.6.1 Vehicle conditions:

- A. Vehicle Load: GVWR
- B. Transmission Position: In Drive

#### S.7.6.2 Test Conditions and Procedures:

**NOTE:** STOP IN SHORTEST DISTANCE ACHIEVABLE (BEST EFFORT) ON ALL STOPS.

IBT: >65°C, <100°C

TEST SPEED: 80 % of vehicle maximum speed but not greater than 160 km/h

PEDAL FORCE: 65 N minimum to 500 N maximum

WHEEL LOCKUP: No lockup of any wheel for longer than 0.1 seconds at speeds greater than 15 km/h

NUMBER OF RUNS: 6 stops

TEST SURFACE: PFC of 0.9

WIND SPEED: Not greater than 5 m/s

## 19. DATA SHEETS....Continued

### S.7.6.3 Performance Requirements

$$\text{STOPPING DISTANCE: } S < 0.10V + 0.0067V^2$$

Calculated distance = \_\_\_\_\_ m

### VISUAL DATA

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Stopping Direction	Pedal Force (N)	Vehicle Decel. (m/s <sup>2</sup> )	Wheel Lockup	Stay in Lane
		Front	Rear			Max.	Max.		
1									
2									
3									
4									
5									
6									

Comments:

### RECORDED DATA

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Pedal Force (N)			Vehicle Decel. (m/s <sup>2</sup> )		Wheel Lockup
		Front	Rear		Min.	Max.	Avg.	Max.	Avg.	
1										
2										
3										
4										
5										
6										

COMPLIANCE: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

DRIVER: \_\_\_\_\_

OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_

## 19. DATA SHEETS....Continued

### DATA SHEET 13 15.9 STOPS WITH ENGINE OFF @ GVWR (S7.7)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

S7.7.1 General Information:  
This test is for vehicles equipped with one or more brake power or assist units.

S7.7.2 Vehicle Conditions

- A. Vehicle Load: GVWR only
- B. Transmission Position: In Neutral
- C. Vehicle Engine: Off (not running)
- D. Ignition Key Position:  
May be returned to "on" position after turning engine off.

S.7.7.3 Test Conditions and Procedures:

**NOTE:** STOP IN SHORTEST DISTANCE ACHIEVABLE (BEST EFFORT) ON ALL STOPS.

**NOTE:** All system reservoirs (brake power and / or assist units) are fully charged and the vehicle's engine is off (not running) at the beginning of each stop.

IBT: >65°C, <100°C

TEST SPEED: 100 km/h

PEDAL FORCE: 65 N minimum to 500 N maximum

WHEEL LOCKUP:

No lockup of any wheel for longer than 0.1 seconds at speeds > 15 km/h



**19. DATA SHEETS....Continued**

NUMBER OF RUNS: 6 stops

TEST SURFACE: PFC of 0.9

WIND SPEED: Not greater than 5 m/s

**S.7.7.4 Performance Requirements:**

\*STOPPING DISTANCE: &lt;70 m from 100 km/h speed

**VISUAL DATA**

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Stopping Direction	Pedal Force (N)	Vehicle Decel. (m/s <sup>2</sup> )	Wheel Lockup	Stay in Lane
		Front	Rear			Max.	Max.		
1									
2									
3									
4									
5									
6									

**RECORDED DATA**

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Pedal Force (N)			Vehicle Decel. (m/s <sup>2</sup> )		Wheel Lockup
		Front	Rear		Min.	Max.	Avg.	Max.	Avg.	
1										
2										
3										
4										
5										
6										

\*  $S < 0.10V + 0.0060V^2$  (Stopping Distance formula for vehicles with top speed <100 km/h)

COMPLIANCE: YES \_\_\_\_\_ NO \_\_\_\_\_

DRIVER: \_\_\_\_\_ OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_

# 19. DATA SHEETS....Continued

## DATA SHEET 14 15.10 COLD EFFECTIVENESS @ LLVW (S7.5)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

REPEAT 15.7 WITH VEHICLE AT LLVW

S.7.5.3 Performance Requirements:

Sc for hot performance stop = \_\_\_\_\_

Avg. PF for hot perf. stop = \_\_\_\_\_

STOPPING DISTANCE: <70 m from 100 km/h speed

### VISUAL DATA

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Stopping Direction	Pedal Force (N)	Vehicle Decel. (m/s <sup>2</sup> )	Wheel Lockup	Stay in Lane
		Front	Rear			Max.	Max.		
1									
2									
3									
4									
5									
6									

Comments:

# 19. DATA SHEETS....Continued

## RECORDED DATA

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Pedal Force (N)			Vehicle Decel. (m/s <sup>2</sup> )		Wheel Lockup
		Front	Rear		Min.	Max.	Avg.	Max.	Avg.	
1										
2										
3										
4										
5										
6										

\*  $S < 0.10V + 0.0060V^2$  (Stopping Distance formula for vehicles with top speed <100 km/h)

COMPLIANCE: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

DRIVER: \_\_\_\_\_

OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_

# 19. DATA SHEETS....Continued

## DATA SHEET 15 15.11 HIGH SPEED EFFECTIVENESS @ LLVW (S7.6) (Not required if vehicle maximum speed is <125 km/h)

VEHICLE:		NHTSA NUMBER:		DATE:	
TEMP.:		WIND VELOCITY:		ROAD PFC:	
ODOMETER START:		ODOMETER FINISH:			

Test Weight: Total = \_\_\_\_\_ kg; Front = \_\_\_\_\_ kg; Rear = \_\_\_\_\_ kg

REPEAT 15.8 WITH VEHICLE AT LLVW

S.7.6.3 Performance Requirements:

STOPPING DISTANCE:  $S < 0.10V + 0.0067V^2$

Calculated distance = \_\_\_\_\_ m

### VISUAL DATA

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Stopping Direction	Pedal Force (N)	Vehicle Decel. (m/s <sup>2</sup> )	Wheel Lockup	Stay in Lane
		Front	Rear			Max.	Max.		
1									
2									
3									
4									
5									
6									

Comments:

## 19. DATA SHEETS....Continued

### RECORDED DATA

Stop No.	Test Speed (km/h)	Initial Brake Temperature (C)		Stopping Distance (m)	Pedal Force (N)			Vehicle Decel. (m/s <sup>2</sup> )		Wheel Lockup
		Front	Rear		Min.	Max.	Avg.	Max.	Avg.	
1										
2										
3										
4										
5										
6										

COMPLIANCE: YES \_\_\_\_\_ NO \_\_\_\_\_

Comments:

DRIVER: \_\_\_\_\_

OBSERVER: \_\_\_\_\_

DATE: \_\_\_\_\_